Interrogation of Absorbate-Induced Segregation in Bimetallic Nanocatalyts Through Multi-dimensional Analytical Imaging in an Aberration-corrected Transmission Electron Microscope

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In situ environmental TEM (ETEM) is a rapidly evolving area and has experienced impressive developments in imaging naomaterials' transformation in response to the change of environments over the past years due to the availability of dedicated environmental TEMs [1] and holder based systems [2]. For example, with help of MEMS-based local heating holders, it is now possible to monitor the subatomic scale changes of nanocatalysts in gases at elevated temperatures [3]. With the tremendous progress made on the sample environment side, the throughput of analytical STEM imaging and spatially resolved EELS spectroscopic imaging becomes a major bottleneck for various applications where real-time 2D and 3D compositional and bonding information is highly needed. Here, in this talk, we present the development of *in situ* 4D STEM-EELS tomography and its application in the first series of experiments that attempt to unravel the time-dependent 3-D chemical restructuring process of bimetallic nanocatalysts upon oxidation. [4, 5]

References:
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